# Global Land Data Assimilation System (GLDAS) Data is now in Giovanni

Giovanni has added a new instance; GLDAS Monthly, which features data from the Global Land Data Assimilation System – GLDAS, naturally. GLDAS is provided by the LDAS project (http://ldas.gsfc.nasa.gov/). The goal of LDAS is make weather forecasting more accurate by providing better simulated data (reanalysis and forecast simulations) that can be used by numerical weather prediction models. LDAS specifically targets soil moisture and energy variables.

GLDAS Giovanni actually has data from four models: CLM (the Community Land Model), Mosaic, Noah, and VIC (the Variable Infiltration Capacity model). The data in GLDAS Monthly fall into three main categories: Water Balance, Energy Balance, and Forcing Parameters. Water Balance includes the important soil moisture parameter and other water-related variables, like rainfall rate and surface runoff; Energy Balance has surface temperature and heat fluxes; the Forcing Parameters include wind speed, temperature, and incident radiation, both shortwave and longwave.

GLDAS Monthly data are available in two resolutions, 1.0 degree and 0.25 degree (0.25 degree data is only in the NOAH model).

GLDAS Monthly is located at: http://gdata1.sci.gsfc.nasa.gov/daac-bin/G3/gui.cgi?instance_id=GLDAS10_M
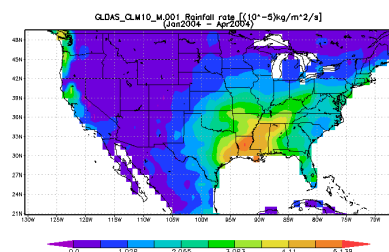
GLDAS rainfall data (CLM model) for January-April 2004.
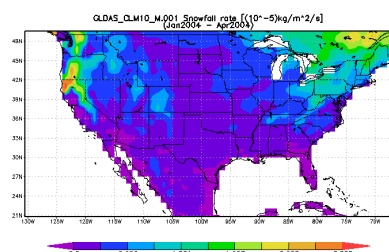
GLDAS snowfall data (CLM model) for January-April 2004.

MONSOON ASIA INTEGRATED REGIONAL STUDY (MAIRS) begins Giovanni presence

The monsoon is legendary; torrential rains sweeping in from the ocean, at times providing incomprehensibly large volumes of warm tropical rainfall – turning modest villages into versions of Venice, where it is easier to get to a neighbor's home by boat than on foot. The monsoon provides rain that makes intensive agriculture possible to feed the growing populations in many countries in the tropical belt, especially India and Southeast Asia.

A new international partnership study has been initiated to evaluate how human activities interact with and affect the monsoon cycle. This partnership is MAIRS, the Monsoon Asia Integrated Regional Study. The MAIRS brochure (http://www.mairs-essp.org/UserFiles/File/Brochure-new.pdf) provides an excellent overview of the themes and goals of MAIRS. MAIRS will attempt to better understand how the monsoon system may change due to human influence, and how these changes could in turn affect the population, socially and economically, in the countries of Asia.

MAIRS in Giovanni provides many of the same data sets that are found in NEESPI Daily and NEESPI Monthly. The data in Giovanni include remotely-sensed atmospheric data and data from atmospheric models; remotely-sensed land parameters and also data from land surface models; and oceanographic data from NASA instruments and NASA models. MAIRS even provides another way to access some of the GLDAS parameters from the NOAH model.

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http://gdata1.sci.gsfc.nasa.gov/daac-
bin/G3/gui.cgi?instance_id=mairs_monthly
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Recent publications of interest using Giovanni

Sorooshian, A., Padro, L.T., Nenes, A., Feingold, G., McComiskey, A., Hersey, S.P., Gates, Jonsson, H.H., Miller, S.D., Stephens, G.L., Flagan, R.C., and Seinfeld, J.H., (2009) *On the link between ocean biota emissions, aerosol, and maritime clouds: Airborne, ground, and satellite measurements off the coast of California*. Global Biogeochemical Cycles, 23, GB4007, doi:10.1029/2009GB003464.

Levy, R., Leptoukh, G., Kahn, R., Zubko, V., Gopalan, A., and Remer, L. (2009). A critical look at deriving monthly aerosol optical depth from satellite data. *IEEE Transactions on Geoscience and Remote Sensing*, **47 (9)**, 2942-2956.

Levy, R.C. (2009) The dark-land MODIS collection 5 aerosol retrieval: Algorithm development and product evaluation. In: *Satellite Aerosol Remote Sensing Over Land*, Alexander A. Kokhanovsky and Gerrit de Leeuw, Editors, Springer Berlin Heidelberg, 19-68, doi 10.1007/978-3-540-69397-0.

Shen, S., Leptoukh, G., Loboda, T., Csiszar, I., Romanov, P., and Gerasimov, I., "The NASA NEESPI Data Portal to Support Studies of Climate and Environmental Changes in Nonboreal Europe" In: *Regional Aspects of Climate/Terrestrial/ Hydrologic Interactions in Nonboreal Eastern Europe*, Groisman, Pavel Ya and Ivanov, Sergiy (Eds.), Springer, 2009, 255 p., pp 9-16.

From the GES DISC News archive:
"As evidenced by a growing body of scientific literature, use of the NASA GES DISC Interactive Online Visualization ANd aNalysis Infrastructure, *Giovanni*, is proliferating in the scientific community. **The number of peer-reviewed research papers utilizing Giovanni surpassed 100 in 2009; in 2009 alone, 46 papers in which Giovanni was used have been published**, and the year isn't over yet – several other papers are known to be "in press" pending publication."

http://disc.sci.gsfc.nasa.gov/giovanni/gesNews/giovanni_science_impact_expands

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MODIS data in Giovanni used at teacher workshop on dust storm impact in the Caribbean

At a workshop for K-12 teachers in Puerto Rico, Giovanni was used to show how to track dust storms from Africa as they cross the Atlantic Ocean and affect the Caribbean Sea region. Dr. Edward Celarier of NASA GSFC and the University of Maryland-Baltimore County demonstrated how to use Giovanni to access aerosol data from NASA satellites and to create images of dust storm events. The workshop took place July 13-17 at the University Puerto Rico-Mayagüez.
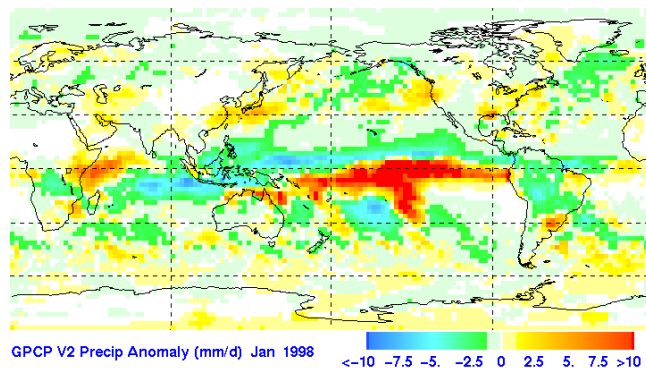

Global Precipitation Climatology Project data updated in Giovanni *NEESPI Daily* and *NEESPI Monthly*

The latest GPCP monthly precipitation data (Version 2.1) have replaced Version 2.0 in the Giovanni NEESPI Monthly instance. The monthly data in Giovanni are derived from GPCP monthly Version 2.1 by regridding the original 2.5° x 2.5° resolution to 1.0° x 1.0° resolution using the Grid Analysis and Display System (GrADS) developed by the Center for Ocean-Land-Atmosphere Studies (COLA). The regridding method used is *box averaging*.

GPCP daily precipitation (Version 1.1) has been integrated in the Giovanni NEESPI Daily instance.

NEESPI stands for the Northern Eurasian Earth Science Partnership Initiative.

GPCP V2 Precip Anomaly (mm/d) Jan 1998   <-10 -7.5 -5. -2.5 0 2.5 5. 7.5 >10

Why is the climatology of global precipitation important? The image above is the precipitation anomaly during January 1998 – when an El Niño of unprecedented size was in full swing. It was raining a lot heavier than normal over the central Pacific Ocean – and a lot less than normal over Indonesia, where forest fires raged in the rain forests. Also notice the heavier-than- normal rain in the Pacific Northwest, where it usually rains quite a bit in the winter, anyway.

Smoke gets in your eyes (and hair and lungs) when fire invades the hills over JPL: personal and spaceborne observations

It'll be a hot time in the old rocket laboratory tonight!

You might have heard: in early September, a fire broke out in the foothills above Los Angeles, and rapidly turned into a tragic, gigantic conflagration that threatened a large portion of the Los Angeles Basin. Members of the EOSDIS User Services Working Group (USWG), which consists of user services representatives from each of the DAACs and data centers in the NASA earth science data system constellation, were meeting in Pasadena at the time, hosted by the PODAAC (Physical Oceanography DAAC) at the Jet Propulsion Laboratory.

Arriving in Pasadena, the flight in curled around the fires and approached Burbank from the south. The final stages before landing provided an excellent view of the breadth of the smoke from the fires. On the ground, it was possible to see pyrocumulus (clouds rising above the heat and smoke) towering over endangered Mount Wilson, where most of Los Angeles gets its television and cellular phone signals from. Losing the top of Mount Wilson would not be good for movie producers! There was a slight tinge of smokiness in the air; the sidewalks had flecks of ash, in some cases still-perfect casts of leaves that crumbled to powdery dust if they were touched. JPL, in fact, had to prepare contingency plans for the control of their interplanetary satellites with the Deep Space Network in case operations could not continue at the laboratory.

The meeting site had a view up the mountains, which normally form a dramatic backdrop to Pasadena. On the second day of the meeting, the mountains couldn't be seen, and JPL was still closed for health reasons. However, the USWG was able to conduct its meeting successfully, and examined several new ways to acquire and utilize the wide variety of satellite remote-sensing data for Earth observations and Earth system science research. Many of these new developments will be shown at the Fall Meeting of the American Geophysical Union in December.

What did it look like from space?
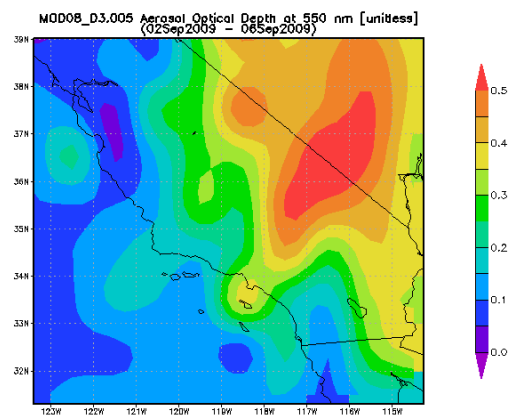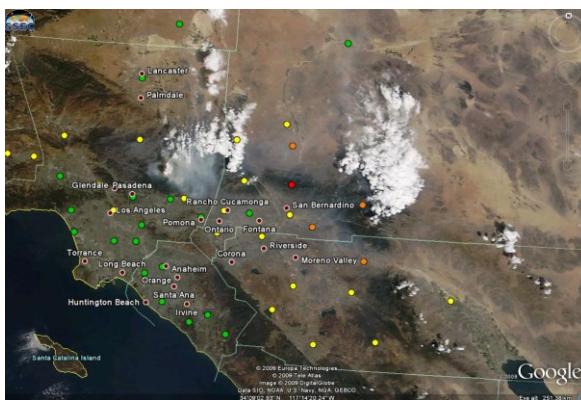
MODIS image in Google Earth of fire smoke, showing pyrocumulus formation (left); MODIS aerosol optical depth plotted in Giovanni, September 2-6, 2009 (right)